CLAIMS

What is claimed is:

1. A casting mold comprising:

at least one mold elements;

a sprue;

a runner system comprising at least one channel;

at least one gate;

at least one chamber located within the runner system and containing a metallurgical modifier.

2. The casting mold of claim 1 wherein the metallurgical modifier is selected from the group of antimony, beryllium, boron, calcium, fluxing salts, phosphorous, silver, sodium, strontium, titanium, titanium boron, vanadium and zirconium, or a combination thereof.

3. The casting mold of claim 1 wherein the metallurgical modifier is strontium.

4. The casting mold of claim 3 wherein the metallurgical modifier is about a 3% to about a 15% strontium-containing alloy in the form of stock material.

5. The casting mold of claim 2 wherein the metallurgical modifier is in the form of bar stock or rod stock material.

6. The casting mold of claim 2 wherein the metallurgical modifier is in granular form.

7. The casting mold of claim 2 wherein the metallurgical modifier is in pellet form.

8. The casting mold of claim 1 comprising a plurality of mold cores and wherein the chamber is bounded by at least two mold cores.

9. The casting mold of claim 1 wherein the chamber is located at or near the at least one gate.

10. The casting mold of claim 1 wherein the chamber is located near the sprue.

11. The casting mold of claim 1 further comprising at least one filter located adjacent to the chamber.

12. The casting mold of claim 11 wherein the at least one filter is a silicon carbide coated ceramic foam filter.

13. The casting mold of claim 1 further comprising means for controlling the flow of molten metal through the chamber.

14. The casting mold of claim 1 comprising a plurality of chambers located within the runner system, each containing at least one metallurgical modifier.

15. The casting mold of claim 14 wherein each of the plurality of chambers contains more than a single type of metallurgical modifier.

16. The casting mold of claim 14 wherein each of the plurality of chambers contains a different metallurgical modifier.

17. The casting mold of claim 1 further comprising a plurality of mold cavities; and

wherein the runner system comprises a plurality of channels with at least one channel serving each of the plurality of mold cavities, and each of the plurality of channels having at least one chamber containing a metallurgical modifier.

18. A casting mold comprising:

at least one mold core;

a sprue;

a runner system;

at least one gate; and

means for adjusting the chemistry of molten metal after the molten metal is introduced into the casting mold during a casting process.

19. A method for casting an article comprising:

providing a casting mold comprising a sprue; a runner system comprising at least one channel; at least one gate; at least one mold element; and at least one chamber located within the runner system;

disposing a metallurgical modifier within the at least one chamber; and

introducing molten metal into the casting mold.

20. The method for casting an article of claim 19 further comprising:

providing a metallurgical modifier selected from the group of, antimony, beryllium, boron, calcium, fluxing salts, phosphorous, silver, sodium, strontium, titanium, titanium boron, vanadium and zirconium, or a combination thereof.

21. The method for casting an article of claim 19 further comprising:

providing a metallurgical modifier comprising strontium.

22. The method for casting an article of claim 21 further comprising:

providing a metallurgical modifier comprising about a 3% to about a 15% strontium-containing alloy in the form of stock material.

23. The method for casting an article of claim 19 further comprising:

locating the chamber near the at least one gate.

24. The method for casting an article of claim 19 further comprising:

locating the chamber near the sprue.

25. The method for casting an article of claim 19 further comprising:

providing at least one filter;

disposing the filter adjacent to the chamber.

26. The method for casting an article of claim 19 further comprising:

providing at least one silicon carbide coated ceramic foam filter;

disposing the filter adjacent to the chamber.

27. The method for casting an article of claim 19 further comprising:

providing a casting mold having a plurality of chambers located within the runner system;

disposing at least one metallurgical modifier in each of the plurality of chambers.

28. The method for casting an article of claim 27 further comprising:

disposing more than a single type of metallurgical modifier in each of the plurality of chambers.

29. The method for casting an article of claim 27 further comprising:

disposing more than a different metallurgical modifier in each of the plurality of chambers.

30. The method for casting an article of claim 19 further comprising:

providing a casting mold comprising a plurality of mold cavities;

providing a plurality of channels within the runner system, at least one channel serving each of the plurality of mold cavities;

providing at least one chamber in each of the plurality of channels;

disposing at least one metallurgical modifier in each of the at least one chamber.